

CLAIMS

WHAT IS CLAIMED IS:

1. A nonwoven fabric comprising at least two separate but interconnected layers, each of the layers being provided with discrete interconnections so as to provide discrete voids between the two layers of fabric.
2. [[A]] The nonwoven fabric according to claim 1 characterised in that the voids comprise a channel within the structure of the fabric.
3. [[A]] The nonwoven fabric according to claim 1 characterised in that the voids comprise a plurality of channels.
4. [[A]] The nonwoven fabric according to claim 2 characterised in that the channels [[are]] have a substantially cylindrical or tubular shape.
5. [[A]] The nonwoven fabric according to claim 1 characterised in that the voids are arranged in a substantially uniform or periodic manner.
6. [[A]] The nonwoven fabric according to claim 1 characterised in that the thickness of the nonwoven [[of]] fabric is from 1 mm to 9 mm.
7. [[A]] The nonwoven fabric according to claim 1 characterised in that the area density of the nonwoven fabric is from 40 to 300 g/m².
8. [[A]] The nonwoven fabric as hereinbefore described according to claim 1 wherein the voids comprise discrete channels within the body of the fabric.
9. [[A]] The nonwoven fabric according to claim 1 characterised in that the fabric weight may be is in the range 20-1000 g/m².

10. [[A]] The nonwoven fabric according to claim 2 characterised in that the width of the channels are in the range from 0.2 mm to 8.5 mm
11. [[A]] The nonwoven fabric according to claim 1 characterised in that the~~wherein said voids contain within them~~further comprise functional materials.
12. [[A]] The nonwoven fabric according to claim 11 characterised in that the functional material is amember selected from a yarn, filament, wire, wax, gel, liquid, pulp [[or]] and particle.
13. [[A]] The nonwoven fabric according to claim 1 in which the~~separated~~separate but interconnected layers are formed from a member selected from carded, air-laid, wet-laid, spun-laid and meltblown[[s]] webs [[or]] and combinations thereof.
14. [[A]] The nonwoven fabric according to claim 1 in which~~the layers are fibrous,~~wherein the layers are fibrous, and wherein at least two fibrous layers are made of different fibre types.
15. [[A]] The nonwoven fabric according to claim 14 in which~~two fibrous layers comprises a~~at least one fibrous layer is hydrophobic and [a] at least one fibrous layer is hydrophilic. ~~layer respectively.~~
16. [[A]] The nonwoven fabric according to claim 12 characterised in that~~wherein the functional material is a member selected from a~~ yarn and a filament and said yarns [[or]] and filaments are made of a member selected from natural, man-made and[[/or]] mineral fibres.
17. [[A]] The nonwoven fabric according to claim 12 characterised in that~~wherein the liquids are~~functional material is a liquid and said liquid is a member selected from cleaning liquids, detergent liquids, paints, perfumes, cosmetics, lotions, ointments, liquid nutrients [[or]] and creams.

18. [[A]] The nonwoven fabric according to claim 12 characterised in that wherein the powders are functional material is a powder and said powder is a member selected from superabsorbents, cleaning agents [[or]]and medicaments.

19. [[A]] The nonwoven fabric according to claim 12 characterised in that wherein the particles are functional material is a particle and said particle is a member selected from a material called Silica gel, activated carbon particles, metallic particles, ceramic particles, polymer particles, phase change material (PCM) particles [[or]]and seed particles.

20. [[A]] The nonwoven fabric according to claim 12 characterised in that wherein the wires are functional material is a wire and said wire is a member selected from electrically conductive wires, shape memory alloy (SMA) wire [[or]]and optical wires.

21. [[A]] The nonwoven fabric according to claim 12 characterised in that wherein the gels are functional material is a gel and said gel is a member selected from hydrogels, medicinal gels [[or]]and hygienic cleaning gels.

22. A method of manufacturing [[a]]the nonwoven fabric as hereinbefore described according to claim 1 which comprises the steps of [[;]]:

- (i) forming a nonwoven fabric from fibre or filament webs on either side of a spacer device; and

- (ii) causing fibres in at least one web to be transferred between the gaps in the spacer device towards the adjacent web (optionally applying the same process to the reverse side of the fabric) to form an integrated structure.

23. [[A]] The method according to claim 22 in which further comprising:

- (iii) using high pressure water jets are used in combination with a rigid spacer device to manufacture the fabric.

24. [[A]] The method according to claim 22 in which the fibre or filament web is formed by a method, which is a member selected from, carding, carding and lapping, air-laid, melt-blowing [[or]]and spunlaid methods.

25. [[A]] The method according to claim 22 in which two or more fibrous layers are introduced on-to the face and back surfaces of [[a]]the spacer device.

26. [[A]] The method according to claim 25 in which the layers are thensubsequently conveyed along the upper and lower surfaces of the spacer device and at the same time are are simultaneously impacted by high pressure water jets, which interconnect groups of fibres in the layers between the spacer elements.

27. [[A]] The method according to claim [[22]] 23 in which the fibres are mechanically entangled by the jets to provide structural cohesion in the fabric.

28. [[A]] The method according to claim 22 in which further comprising:

(iv) introducing a functional material is introduced into the channel-like voids during the process.

29. [[A]] The method according to claim [[22]] 28 in which [[if]] the channel-like voids are filled with functional components, they are protected from the water jets during the bonding stage step (iii).

30. [[A]] The method according to claim 22 in which at the end of the process, further comprising:

(v) removing the formed fabric is removed from the spacer system at the end of the process, to leave a 3D fabric structure.

31. [[A]] The method according to claim 22 which wherein the method is continuous.

32. [[A]] The method according to claim 22 in which further comprising:

(vi) bonding the fabric is additionally thermally bonded.

33. [[A]] The nonwoven fabric according to claim 1 characterised in that the nonwoven fabric is suitable for the controlled release of one or more medicaments.

34. [[A]] The nonwoven fabric according to claim 1 characterised in that the nonwoven fabric is suitable for containing and/or delivering one or more cleaning fluids.

35. [[A]] The nonwoven fabric according to claim 1 characterised in that the nonwoven fabric is in the form of an absorbent article.

36. [[A]] The nonwoven fabric according to claim 35 characterised in that wherein the absorbent article is a member selected from a wipe, a wound dressing, a baby diaper component, an incontinence pad, and a feminine hygiene absorbent pad.

37. ~~A nonwoven fabric according to claim 35 characterised in that the absorbent article is a wound dressing.~~

38. ~~A nonwoven fabric according to claim 35 characterised in that the absorbent article is a baby diaper component.~~

39. ~~A nonwoven fabric according to claim 352 characterised in that the absorbent article is an incontinence pad.~~

40. ~~A nonwoven fabric according to claim 35 characterised in that the absorbent article is a feminine hygiene absorbent pad.~~

[[41]] 37. [[A]] The nonwoven fabric according to claim 1 characterised in that the nonwoven fabric is suitable for light-weight thermal insulation.

[[42]]38. The use of a nonwoven fabric according to claim 1 in the manufacture of an article.

[[43]]39. The use according to claim [[42]]-characterised in that 38 wherein the article is a member selected from the group; a medicament delivery device, a cleaning fluids delivery device, an absorbent article, a wipe, a wound dressing, a baby diaper component, an incontinence pad, a feminine hygiene absorbent pad and a thermal insulation material.

[[44]]40. A method of delivering a functional material which comprises the use of [[at]]the nonwoven fabric according to claim 1.

45. ~~A device for manufacturing nonwoven fabric according to claim 1 wherein the device is substantially as described with reference to the accompanying examples and drawings.~~

46. ~~A nonwoven fabric substantially as described with reference to the accompanying examples and drawings.~~